

# Comparisons of Job Characteristics

**Focus Occupation:** Mining and Geological Engineers, Including Mining Safety Engineers (17-2151)

**Associated Occupation:** Civil Engineers (17-2051)

[Compare Knowledge](#)

[Compare Skills](#)

[Compare Abilities](#)

[Compare Detailed Work Activities](#)

[Compare Tools and Technologies](#)

<<	Focus occupation element is much lower
<	Focus occupation element is lower
0	Focus occupation element is at a similar level
>	Focus occupation element is at a higher level
>>	Focus occupation element is at a much higher level

## Knowledge

Similarity of Focus Occupation to Associated Occupation: 87

**Focus Occupation:** Mining and Geological Engineers, Including Mining Safety Engineers (17-2151)

**Associated Occupation:** Civil Engineers (17-2051)

Associated Occupation's Key Knowledge Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating	Evaluation of Focus Occupation	
Engineering and Technology	5.7	24.5	20.6	<<	Extensive education and/or training may be required
Design	5.2	23.4	16.6	<<	Extensive education and/or training may be required
Building and Construction	4.0	21.6	10.7	<<	Extensive education and/or training may be required
Mathematics	9.2	20.0	15.3	<<	Extensive education and/or training may be required
Physics	4.3	15.8	11.4	<<	Extensive education and/or training may be required
Transportation	4.6	13.9	8.2	<<	Extensive education and/or training may be required
Administration and Management	8.4	13.0	11.0	<	Expanded education and/or training may be required
Public Safety and Security	6.9	12.6	10.9	<	Expanded education and/or training may be required
Law and Government	5.9	11.3	12.5	>	Current knowledge level is likely sufficient
Chemistry	4.8	10.8	10.2	0	Current knowledge level may be sufficient
Geography	3.9	9.7	10.2	0	Current knowledge level may be sufficient

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.

## Skills

Similarity of Focus Occupation to Associated Occupation: 92

**Focus Occupation:** Mining and Geological Engineers, Including Mining Safety Engineers (17-2151)

**Associated Occupation:** Civil Engineers (17-2051)

Associated Occupation's Key Skills Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating	Evaluation of Focus Occupation	
Mathematics	6.2	15.7	13.9	<	A higher skill level may be required
Operations Analysis	5.0	14.6	11.5	<<	Extensive development of skills in this area may be required
Complex Problem Solving	9.1	14.5	14.8	0	Current skill level may be sufficient
Judgment and Decision Making	9.4	14.5	15.1	0	Current skill level may be sufficient
Science	4.5	11.9	11.5	0	Current skill level may be sufficient
Systems Analysis	6.5	11.7	13.0	>	Skill level is likely sufficient
Systems Evaluation	6.4	11.7	12.7	0	Current skill level may be sufficient
Management of Personnel Resources	6.9	11.2	10.0	<	A higher skill level may be required
Management of Material Resources	3.7	9.1	9.7	0	Current skill level may be sufficient
Management of Financial Resources	3.3	8.9	9.8	>	Skill level is likely sufficient

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.

## Abilities

Similarity of Focus Occupation to Associated Occupation: 97

Focus Occupation: Mining and Geological Engineers, Including Mining Safety Engineers (17-2151)

Associated Occupation: Civil Engineers (17-2051)

Associated Occupation's Key Abilities Elements	Average Rating, All Occupations	Associated Occupation's Rating	Focus Occupation's Rating	Evaluation of Focus Occupation	
Problem Sensitivity	11.1	15.4	14.8	0	Current ability level may be sufficient
Deductive Reasoning	10.6	15.2	15.5	0	Current ability level may be sufficient
Mathematical Reasoning	6.3	14.9	12.8	<	Some improvement in abilities may be required
Inductive Reasoning	10.2	14.4	14.1	0	Current ability level may be sufficient
Visualization	7.5	14.1	12.4	<	Some improvement in abilities may be required
Number Facility	6.3	13.9	10.1	<<	Extensive improvement in abilities may be required
Information Ordering	9.9	13.8	14.4	0	Current ability level may be sufficient
Category Flexibility	9.0	13.4	13.8	0	Current ability level may be sufficient
Flexibility of Closure	7.8	13.3	12.2	0	Current ability level may be sufficient
Perceptual Speed	7.4	11.8	9.0	<<	Extensive improvement in abilities may be required
Speed of Closure	5.9	9.9	8.7	<	Some improvement in abilities may be required

The maximum possible rating is 25.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.

## Activities that Both Occupations Have in Common

Similarity of Focus  
Occupation to Associated  
Occupation: 94

**Focus Occupation: Mining and Geological Engineers, Including Mining Safety Engineers (17-2151)**  
**Associated Occupation: Civil Engineers (17-2051)**

Work Activities	Exclusivity of Activity
Adhere to safety procedures	12
Advise clients or customers	19
Advise clients regarding engineering problems	67
Analyze ecosystem data	69
Analyze engineering design problems	69
Analyze engineering test data	71
Analyze project proposal to determine feasibility, cost, or time	69
Analyze scientific research data or investigative findings	27
Analyze technical data, designs, or preliminary specifications	47
Analyze test data	64
Assign work to staff or employees	30
Bid engineering, construction or extraction projects	80
Calculate engineering specifications	64
Collect scientific or technical data	30
Communicate technical information	4
Compile numerical or statistical data	38
Compute production, construction, or installation specifications	58
Conduct land surveys	81
Conduct topographical surveys	89
Confer with engineering, technical or manufacturing personnel	25
Coordinate engineering project activities	71
Create mathematical or statistical diagrams or charts	43
Delegate authority for engineering activities	73
Design construction projects	81
Determine specifications	67
Develop or maintain databases	30
Develop plans for programs or projects	31
Develop policies, procedures, methods, or standards	21
Develop tables depicting data	33
Direct and coordinate activities of workers or staff	3
Direct and coordinate construction of mine shafts or tunnels	89
Direct personnel in support of engineering activities	74
Draw prototypes, plans, or maps to scale	57
Evaluate costs of engineering projects	70
Evaluate engineering data	60
Examine engineering documents for completeness or accuracy	62
Explain complex mathematical information	30
Inspect facilities or equipment for regulatory compliance	51
Inspect project operations, or site to determine specification compliance	72

Interpret aerial photographs	69
Interpret maps for architecture, construction, or engineering project	77
Lead teams in engineering projects	73
Perform safety inspections in construction or resource extraction setting	46
Plan construction of structures or facilities	75
Plan testing of engineering methods	72
Prepare reports	8
Prepare technical reports or related documentation	22
Provide analytical assessment of engineering data	75
Read blueprints	10
Read maps	42
Read technical drawings	7
Resolve engineering or science problems	46
Test equipment as part of engineering projects or processes	67
Understand construction specifications	53
Understand engineering data or reports	48
Use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks	58
Use computers to enter, access or retrieve data	3
Use drafting or mechanical drawing techniques	50
Use government regulations	44
Use intuitive judgment for engineering analyses	72
Use knowledge of investigation techniques	16
Use knowledge of materials testing procedures	70
Use knowledge of regulations in surveying or construction activities	78
Use land surveying techniques	80
Use mathematical or statistical methods to identify or analyze problems	30
Use pollution control techniques	62
Use project management techniques	47
Use quantitative research methods	35
Use relational database software	26
Use scientific research methodology	21
Use spreadsheet software	18
Use technical regulations for engineering problems	61
Use word processing or desktop publishing software	17
Work as a team member	36
Write business project or bid proposals	48

Not all positions in these occupations will necessarily perform all of the listed activities. The exclusivity rating is an indication of how unique the activity is amongst all occupations. The maximum rating is 100. High scores indicate that only a small number of occupations engage in that activity.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.

## Tools and Technologies that Both Occupations Have in Common

Similarity of Focus  
Occupation to Associated  
Occupation: 81

**Focus Occupation:** Mining and Geological Engineers, Including Mining Safety Engineers (17-2151)  
**Associated Occupation:** Civil Engineers (17-2051)

Tools and Technologies

Exclusivity

Audio and visual equipment	4
Business function specific software	1
Computer printers	2
Computers	1
Content authoring and editing software	1
Data management and query software	1
Industry specific software	1
Measuring and layout tools	3

Not all positions in these occupations will necessarily use all of the listed tools and technologies. The exclusivity rating is an indication of how unique the tool or technology is amongst all occupations. The maximum rating is 100. High scores indicate that only a small number of occupations use that tool or technology.

Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section analysis of O\*NET (Occupation Information Network) data.